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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/022,224	12/20/2001	Takashi Katsumata	11-076	4216

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EXAMINER
HANLEY, JOHN C

ART UNIT	PAPER NUMBER
2856	

DATE MAILED: 05/06/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/022,224	KATSUMATA ET AL.	
	Examiner	Art Unit	
	John C Hanley	2856	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 February 2002* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-13* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *12 February 2002* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *12/20/01* (2)
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Drawings

1. The drawings are objected to because the lead lines from the lower left numeral 36 in Figures 1 and 4 are pointing to the wrong element of the drawings. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

2. The abstract of the disclosure is objected to because of improper grammar, i.e., sentence structure and verb tense. Also, no mention is made of the dummy electrodes and their use for providing a cancellation signal to the monitor and detection signals. Correction is required. See MPEP § 608.01(b).

3. The disclosure is objected to because of the following informalities: on page 7, lines 15-19, the introduction of elements should be labeled with their drawing numbers; on page 8, line 19, oxide film 13 is mislabeled 14, and teeth 34 are inconsistent with the drawings. Incomplete sentences are found bridging pages 13 to 14 and 14 to 15. On page 7, line 25, "except" is misspelled. The use of "fF" for the capacitor quantity in the top paragraph of page 14 is questioned. Should these be "pF"?

Appropriate correction is required.

Claim Objections

4. Claims 1, 5, 6-7 and 13 are objected to because of the following informalities: the term "fix portion" is used throughout these claims. "Fixed portion" would not be objectionable. Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. Claims 1-13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

6. Claim 13 recites the limitation "said signal electrode" in line 20. There is insufficient antecedent basis for this limitation in the claim.

7. The phrase "fix portion including with electrical insulation" and similar phrases in claims 1, 5, 7 and 12 is grammatically incorrect, vague, and indefinite.

8. The use of the term "near" throughout the claims, e.g., claim 4, is vague and indefinite because it is a relative term having no specific limitation.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. Claims 1-4, 6 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi (US 5,969,225) in view of Itoh (US 6,119,518).

11. Kobayashi, Figure 8, shows a semiconductor device for sensing angular frequency having a fixed substrate formed of, for example, a high resistance silicon material (insulation), the substrate being formed in a rectangular shape. Also included is a movable portion supported for movement in an x direction by application of a capacitance driving means (input means), and a detection means for detecting capacitive variation (output means) in a y

direction caused by driving the movable portion by the input means. The input and output electrodes associated with the input and output means, respectively, are arranged on different sides of the rectangular shape. In column 4, lines 11+, Kobayashi specifically recognizes the problem of parasitic capacitance causing leakage of drive signals into the detecting means, and specifically motivates one to reduce the leakage. Other than the lack of specific teachings of electrode leads and a circuit substrate inherently required and obvious to complete the device for its intended use, Kobayashi lacks a specific teaching of shielding means to reduce cross talk. Electrostatic shielding is a well-known engineering solution to the problem of capacitive coupling. However, Itoh specifically teaches to use grounded shields for electrostatically isolating the driving terminals and the detecting terminals of an angular velocity sensor. It would have been obvious to one skilled in the art at the time of applicant's invention to reduce capacitive coupling between the input and output of Kobayashi by the use of grounded electrostatic shields as taught in Itoh, since Kobayashi recognizes the need to reduce the problem in such a sensor layout, and Itoh also recognizes the same problem and offers an alternative solution. The physical placement of the shield near any one of the electrodes to be shielded would have been obvious to anyone skilled in the art of shielding.

12. Claims 5 and 7-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi in view of Itoh as applied to claims 1-4, 6 and 13, above, and further in view of Ward (US 6,445,195). The combination of Kobayashi in view of Itoh lacks a teaching of monitor and dummy electrodes. Ward teaches the use of pick-off electrodes (monitor electrodes) to feedback positional information of the movable portion to correct and control the drive means. Ward further recognizes the problem of signal coupling between

the drive electrodes and both the monitor and detector electrodes. Ward further teaches to detect drive feed through via a sensor and nulling the measured components by adjusting the amplitude of the drive signal(s). It would have been obvious to one of ordinary skill in the art at the time of applicant's invention to provide monitor electrodes to the device of Kobayashi, as combined with Itoh, to better control the driving means of Kobayashi, as taught in Ward. In view of the fact that the monitor electrodes are recognized by Ward as having drive feed through problems along with the detector electrodes, it would have been further obvious in view of Itoh to shield the monitor electrodes from the drive electrodes as well. The "dummy electrodes" of claims 5 and 12, as recited, could read on any shielding electrode or other electrode. Hence, their intended functional use is not given any weight. However, it would have been further obvious in view of Ward to use means for sensing the drive feed through to obtain a signal to null the feed through in the drive electronics.

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Lemkin et al (US-2001/0032508 A1) shows the use of shielding electrodes in vibratory rate gyros, and further teaches that "parasitic capacitance in parallel with the sense capacitors may arise, for example, form interconnection capacitance (i.e. form two parallel metal wire) or from fringing field capacitance from structural electrodes; this parasitic capacitance is typically easy to minimize as compared to parasitic capacitance to a substrate node, for instance." Clark (US 5,992,233) shows a generally rectangular gyro with monitor electrodes for drive feedback. Lutz (US 5,728,936) and Kipp et al (US 6,536,281) show sensors on silicon on insulator substrates. DeRoo et al (US 2002/0020219) recognize capacitive

coupling between input and output. Weinberg et al (US 5,892,153), Hsu et al (US 5,955,668), and Koury et al (US 6,070,464) show shielding. The remaining patents show rectangular layouts.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John C Hanley whose telephone number is 703-305-5130. The examiner can normally be reached on M-F 9AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron Williams can be reached on 703-306-4705. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

JCH
April 28, 2003

HELEN KWOK
PRIMARY EXAMINER